

original investigator endowed with an extraordinary capacity for work. In these respects meteorology is perhaps the sternest of the sciences in exacting from those of its votaries who make any permanent contribution to its literature not only keen scientific insight, but also courage to encounter for years, if need be, the constant drudgery of calculations before the end sought can be attained.

That Dr. Jelinek published scarcely any important work on meteorology from 1850 to 1865 need excite no surprise if we keep in view the great and important works on Austrian meteorology which appeared in quick succession from his pen between the years 1865 and 1870. The papers here referred to, about ten in number, several being really voluminous productions, are all of them rich in well-digested tabular matter, which, in relation to the subjects discussed, is of the most satisfying character. The paper on the five-day mean temperatures at Austrian stations from 1848 to 1863 contains 130 closely-printed quarto pages of tables. Among the subjects discussed in these papers are the mean annual and monthly distribution of atmospheric pressure and thunderstorms, and the annual, monthly, five-day, daily, and hourly distribution of temperature over the Austrian Empire; the temperature of Vienna for the ninety years from 1775 to 1864 thus supplying data calculated to throw light on not a few cosmical questions; the cold weather which occurs in May, and the storms of November and December, 1866. An important result of this work is that over the whole of Austria a closely approximate statement can be given as to how far the temperature as observed at any hour of any day of the year is above or below the average. In addition to the above, he wrote his admirable and well-known "Anleitung zu Meteorologischer Beobachtung," which has already in the present year reached its third edition, and in 1866 established and edited, jointly with Dr. Hann, the *Journal* of the Austrian Meteorological Society, which is published fortnightly, and which, from its liberal and catholic spirit, and the position in science it has attained, stands alone among meteorological publications. In 1865 he succeeded in introducing telegraphic weather reports in Austria. Dr. Jelinek was also Secretary of the Meteorological Society of Austria, and the important services he rendered in connection with the Meteorological Congresses at Leipzig and Vienna are well known.

Thus the Austrian Meteorological Institute, under Dr. Jelinek's management, has not merely made observations and published results, but it has also discharged the functions of a discussing body of a high order. The domain of meteorology in which Dr. Jelinek takes the highest position is that which is concerned with the discussion of averages, taking the term in its widest significance. It is here where his scientific insight appears to the best advantage. We may refer in illustration to the judicious use he makes of the method of differentiation in the discussion of such problems as the normal atmospheric pressure in Austria during the months of the year. He does not commit the mistake of taking different terms of years for different places, according as observations at each place were available, but by the application of the method of differentiation he practically takes the same terms of months and years for all places. In all his writings there is evinced the greatest care to avoid giving expression to any view or speculation unless he had taken the trouble of collecting together all available information that lay in his power bearing on the point in question.

He died, after a lingering illness, on October 19, being thus prematurely cut off at the comparatively early age of fifty-four—a man of singularly noble and spotless character, ever on the alert, if we may use the expression, to discover and recognise real work wherever it appeared, and ever ready to offer his help to workers in science, even though he could do so only at the expense of much

personal trouble and fatigue. His beneficence was characteristic of the man, being absolutely without ostentation, and his kindly acts were performed as if his left hand knew not what his right was doing.

OUR ASTRONOMICAL COLUMN

THE DISTANCES OF THE STARS.—We shall here endeavour to present at one view the most reliable results of investigations relating to stellar parallax up to the present time. In making the selection parallaxes less than a tenth of a second of arc are omitted except in the case of the pole-star, for which independent researches have given values closely approximating to this amount. In estimating the "light-years," we adopt Struve's determination of the time occupied by light in traversing the mean distance of the earth from the sun, viz., 8m. 17.78s. (According to Leverrier's last value for the solar parallax, and Clarke's diameter of the earth's equator, this would assign for the velocity of light, 185,360 miles per second, at which rate of travelling it would arrive at the planet Neptune in 4h. 10m., or the breadth of the planetary spaces as at present known would be traversed in less than 8½ hours.) By "light-years" is of course to be understood the interval which light would require to pass from the star to the earth at the distances respectively assigned.

The authorities are, for α Centauri, Henderson's value as corrected by Peters, and that of Moesta, the mean; for β Cygni, Auwer's mean of his own result and that of Otto Struve; Lalande 21185, Winnecke; β Centauri, Sir Thomas Maclear; μ Cassiopeæ, Otto Struve; Groombridge 34, Auwers; Capella, Otto Struve; Lalande 21258, Krüger; Oeltzen 17415, Krüger; σ Draconis, Brünnow; Sirius, Gylden from Maclear's observations at the Cape of Good Hope; α Lyrae, Brünnow's mean; γ Ophiuchi, Krüger; η Cassiopeæ, Otto Struve; Procyon, Auwers; Groombridge 1830, a mean of results of Brünnow, Schlüter, Wichmann, and Otto Struve; and for Polaris, Peters.

Name of Star and Magnitude.	Annual Parallax.	Distance in Solar Distances.	Light-years.
α Centauri (1 and 4) ...	0.928 ...	222,300 ...	3.5
β Cygni (5½ and 6) ...	0.553 ...	373,300 ...	5.9
Lalande 21185 (7½) ...	0.501 ...	411,700 ...	6.5
β Centauri (1) ...	0.470 ...	439,100 ...	6.9
μ Cassiopeæ (5½) ...	0.342 ...	603,100 ...	9.5
Groombridge 34 (8½) ...	0.307 ...	671,900 ...	10.6
Capella (1) ...	0.305 ...	676,300 ...	10.7
Lalande 21258 (8½) ...	0.271 ...	761,400 ...	12.0
Oeltzen 17415 (8½) ...	0.247 ...	835,100 ...	13.2
σ Draconis (5) ...	0.246 ...	838,500 ...	13.2
Sirius (1) ...	0.193 ...	1,069,000 ...	16.9
α Lyrae (1) ...	0.180 ...	1,146,000 ...	18.0
γ Ophiuchi (4½) ...	0.162 ...	1,273,000 ...	20.1
η Cassiopeæ (4½ and 7) ...	0.154 ...	1,339,000 ...	21.1
Procyon (1) ...	0.123 ...	1,677,000 ...	26.5
Groombridge 1830 (6½) ...	0.118 ...	1,748,000 ...	27.6
Polaris (2) ...	0.091 ...	2,267,000 ...	35.7

In the third column is given the distance of the star from the earth, in mean distances of the earth from the sun, as is usual; it will be seen how greatly the alteration, even of a single unit in the last decimal place of the annual parallax in the preceding column, affects these numbers.

So far as our present knowledge extends, light, travelling at upwards of 185,000 miles per second requires 3½ years to pass from the nearest fixed stars to the earth, and it does not reach us from our well-known northern polar star in less than thirty-five years.

THE TOTAL SOLAR ECLIPSES OF 1239, JUNE 3, AND 1241, OCTOBER 6.—Prof. Celoria has published an important memoir on these eclipses, in the *Transactions* of the Royal Institute of Sciences at Milan, vol. xiii. He refers to a note in NATURE, vol. xii., p. 167, in which, when remarking on his first compu-

tation of the eclipse of 1239, it was suggested that this phenomenon might deserve further examination in connection with the eclipse of 1241, which had been already calculated by Hansen. The present memoir contains a very careful and complete discussion of the two eclipses, employing Leverrier's tables for the sun, and Hansen's lunar tables, except that the last values for the terms involving the square of the time, given by Hansen in "Darlegung der theoretischen Berechnung der in den Mondtafeln angewandten Störungen," Part 2, are substituted for the values adopted in the tables. The position of the belt of totality in the eclipse of 1241, in its passage across Germany, is very well defined by the statements of contemporary writers, taken chiefly from the great work of Pertz, "Monumenta Germaniæ Historica;" Prof. Schiaparelli had been similarly successful in laying down the actual track of totality across Italy in the eclipse of 1239, from the Records in Muratori's collection of Italian writers. In both cases totality is assumed to have taken place, when there is distinct mention of stars having appeared, which is about the only criterion that has value at these distant times. We shall probably revert to the subject of Prof. Celorai's able memoir.

NOTES

MANY geologists who have visited the Philadelphia Exhibition and seen the geological collections there have been impressed with the importance of having as nearly complete a collection as possible on exhibition, of geological specimens, maps, and sections, in accordance with a previously arranged plan. The International Exhibition to be held at Paris in 1878 will furnish such an occasion, and it is proposed to invite to that end governmental geological surveys, learned societies and private individuals throughout the world, to send to Paris such collections as will make the geological department of that exhibition as complete as possible. In order to take advantage of the collections which may thus be brought together, it is moreover proposed to convoke an International Geological Congress, to be held at Paris at some time during the Exhibition of 1878, and to make that Congress an occasion for considering many disputed problems in geology. In accordance with this plan it is proposed that the Geological department of the International Exhibition of 1878 shall embrace:—1. Collections of crystalline rocks, both crystalline schists and massive or eruptive rocks, including the so-called contact-formations and the results of the local alteration of uncrystalline sediments by eruptive masses. 2. Collections illustrating the fauna and the flora of the Palæozoic and more recent periods. 3. Collections of geological maps, and also of sections and models, especially such as serve to illustrate the laws of mountain structure. In pursuance of the above plan the American Association for the Advancement of Science during its annual meeting at Buffalo, appointed a Committee to carry out this scheme, to which were added the names of Prof. Huxley, Dr. Otto Torell, and Dr. E. H. von Baumhauer. Prof. James Hall was elected chairman, and Dr. T. Sterry Hunt, secretary. It was then resolved to prepare a circular to be printed in English, French, and German, and distributed to geologists throughout the world, asking their co-operation in this great work of an International Geological Exhibition and an International Geological Congress to be held at Paris in 1878; the precise date of the Congress to be subsequently fixed. All those interested in this project are invited to communicate with any one of the following members of the Committee:—Prof. T. H. Huxley, London, England; Dr. Otto Torell, Stockholm, Sweden; Dr. E. H. von Baumhauer, Harlem, Holland; Dr. F. Sterry Hunt, Boston, Mass., U.S.A.

At a recent meeting of the Literary and Philosophical Society of Manchester, Prof. Osborne Reynolds, in justly

animadverting on the large type sensation headings in which some newspapers announced what, in their perversity or ignorance, they called the "failure" of the Arctic expedition, showed that in truth the expedition had been one of the finest achievements ever accomplished. Looked at boldly, it comes to this. Since Hudson's time, more than 200 years ago, Arctic navigators had succeeded in penetrating about sixty or seventy miles of the 540 to be passed before the Pole could be reached. Whereas Capt. Nares has, in one year, carried the British flag some sixty miles nearer, so that nearly one half, and this by far the most difficult half, of the entire results of all expeditions since Hudson's time has been accomplished by the last. And this is not all. Capt. Nares seems to have pursued the journey to its end, at least by that route; and in coming back can say that he did not leave a single uncertainty behind him. So far, therefore, from having been a failure, this has been the most successful expedition ever sent out.

It is expected that the French Government will ask our Admiralty to establish an Arctic department in the Exhibition of 1878, in which all the relics of English Arctic exploration will be collected and exhibited, as well as all the Parliamentary papers and publications relating to the subject.

M. CHEVREUL was entertained at dinner the other day at the Café Corazza, in the Palais Royal, by eighty *savants* in celebration of the fiftieth anniversary of his professorship and membership of the Academy of Sciences. M. Chevreul, now the oldest member of the Academy of Sciences, is ninety years old, and enjoys perfect health and mental vigour. The most notable instances of academical longevity have been Fontanelle, one of the perpetual secretaries, who died in 1742, aged close on 100 years; M. Biot, who lived ninety-two years, and preserved to the end of his days his mental powers; M. Mathieu, who died March 5, 1875, was also a nonagenarian, and the *Annuaire du Bureau des Longitudes* for 1875 was edited by him. He had succeeded in 1817 Messier, an astronomer, who was an Academician during more than forty years, so that the same seat had only two occupants in a whole century.

A SERIES of lectures is now being given by eminent men of science, explanatory of the instruments in the Loan Collection of Scientific Apparatus at South Kensington. The lectures are free, and working men are invited to attend. The lectures at present arranged for are as follows:—Saturday, November 25, Prof. W. Leith Adams, F.R.S., on "Extinct Animals," as represented by magic lantern slides and specimens in the loan collection. Saturday, December 2, J. S. Gardner on "The Collection of Fossil Leaves." Saturday, December 9, J. Norman Lockyer, F.R.S., on "The Spectroscopes in the Collection." Saturday, December 16, Prof. Huxley, F.R.S., on "The Systematic Teaching of Biology." The lectures will be delivered in the Lecture Theatre of the South Kensington Museum at eight o'clock P.M.

PROF. HUGHES read a paper before the Cambridge Philosophical Society last Monday, in which he criticised the evidence offered to support the view that man existed on the earth during or before the glacial period. He first reviewed several of the older cases which had been put forward, and tried to show that the evidence was always incomplete, or that its trustworthy character disappeared on closer examination. Coming to the two more recent and important instances of human remains or implements being found beneath glacial beds or in beds older than the glacial, Prof. Hughes gave his opinions from personal inspection and acquaintance with the localities. The human fibula found under glacial till in Victoria Cave, Settle, with *Elephas antiquus*, *Rhinoceros leptorhinus*, &c., had been regarded as decisive. Mr. Tiddeman (NATURE, vol. xiv. p.